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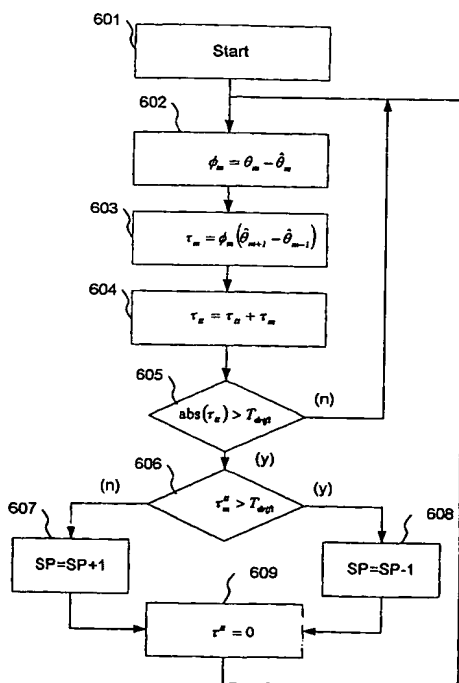
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- (71) Applicant (for all designated States except US): **TELEFONAKTIEBOLAGET LM ERICSSON (publ)** [SE/SE]; S-164 83 Stockholm (SE).
- (72) Inventor; and  
(75) Inventor/Applicant (for US only): **WILHELMSSON, Leif** [SE/SE]; Lyftvägen 5, S-240 10 Dalby (SE).
- (74) Agent: **ZACCO DENMARK A/S**; Hans Bekkevolds Allé 7, DK-2900 Hellerup (DK).
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(54) Title: A SIGNAL PROCESSING APPARATUS AND METHOD FOR DECISION DIRECTED SYMBOL SYNCHRONISATION



(θ̂) (I)

(θ̂; θ) (II)

(57) Abstract: A signal processing apparatus (400;800) comprising: a demodulator (e.g. a PSK demodulator) (407;900) arranged to demodulate a received signal, which carries consecutive symbols ( $a_1, \dots, a_k$ ) at a symbol rate, wherein the demodulator (407;900) is arranged, based on sample values of the received signal, to calculate an error value ( $\phi_m$ ) of a given symbol relative to a decision-directed determination of an expected symbol value (I); and a phase-shifter (406;409;801;1002,1013) arranged to shift the phase of sampling points in time at which points in time, sample values of the received signal is provided to the demodulator (407;1000). The invention is characterized in that the apparatus (400;900) comprises a processor (408;601;1000) arranged to evaluate an error metric ( $\tau$ ), at the symbol rate, for a given symbol as a function of the error value ( $\phi$ ) and symbol values (II), and to determine whether to shift the phase of the sampling points in time based on further evaluation of the error metric ( $\tau$ ). Thereby an optimal sampling instant can be provided based on estimation of Inter Symbol Interference.

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